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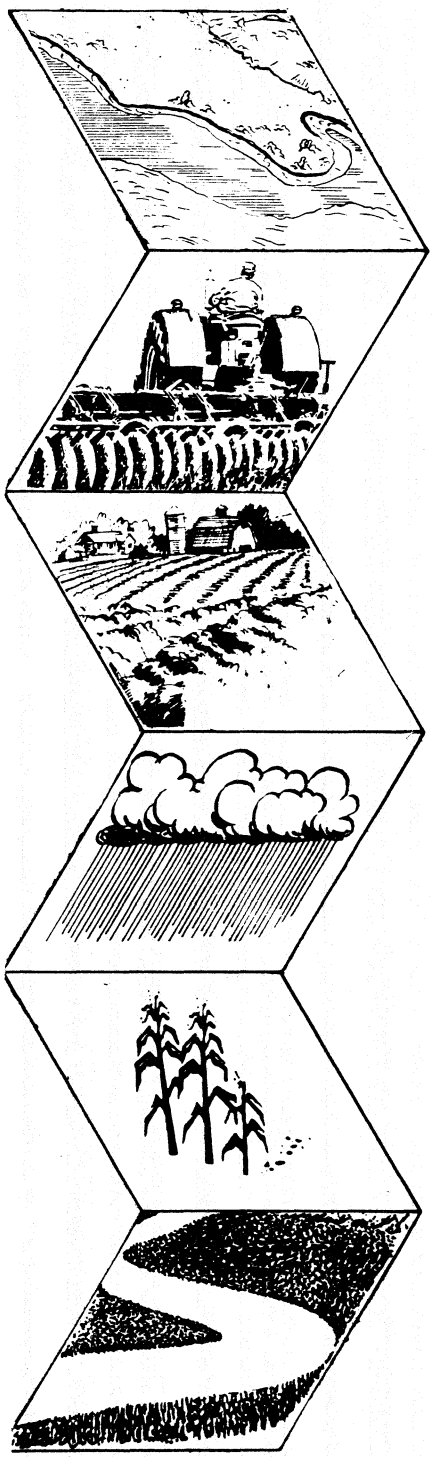

FARMERS' ATTITUDES AND CONSERVATION PRACTICES WHICH AFFECT AGRICULTURAL WATER QUALITY IN NORTHWEST OHIO

by

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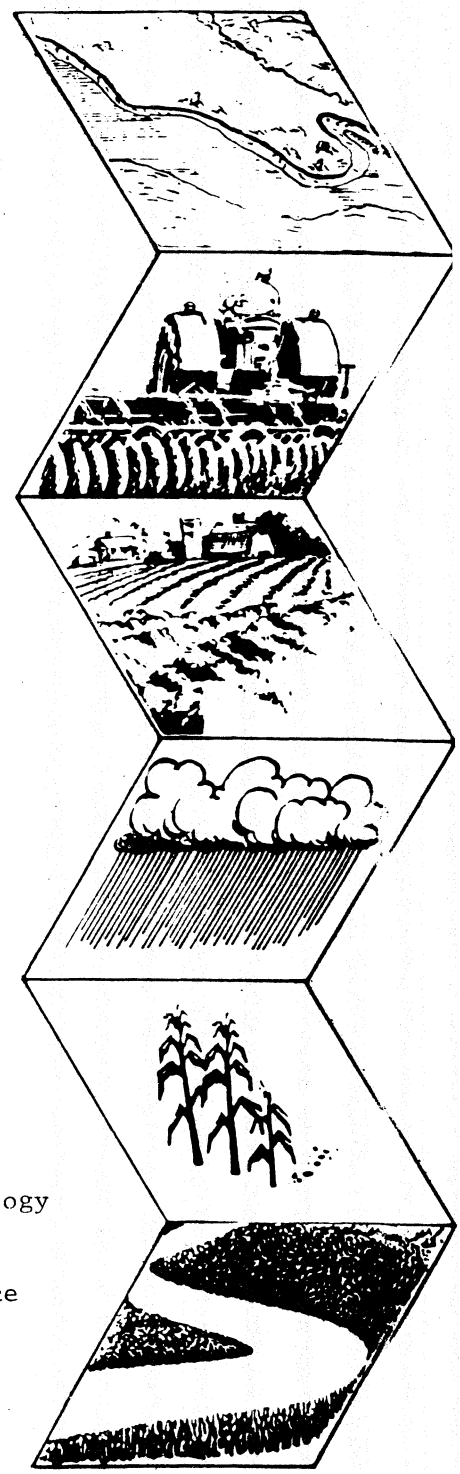

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Raymond A. Schindler
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Robert Rettig

There is much concern over the condition of our lakes and streams, with Lake Erie targeted as one of two lakes in the United States needing immediate attention. With reduction of pollution from cities already taking place, officials are now looking at ways to reduce pollution from agricultural sources.

Under Section 208 of the Federal Water Pollution Control Act of 1972 (PL 92-500), plans for improving water quality were set forth. These "208" plans, when completed and approved, have the potential of limiting agricultural activities. Both the Federal Rural Clean Water Program of 1977 (PL 92-517) and the Ohio Agricultural Pollution Control and Urban Sediment Control Program of 1978 (HB 513) called for the voluntary use of crop management practices which could improve water quality. These are referred to as "best management practices."

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Before effective educational and technical assistance programs aimed at reducing agricultural sedimentation and nutrient loading of streams can be developed, farmers' attitudes on water quality problems as well as practices now being used by farmers that affect water quality must be known.

A survey of farmers' attitudes and use of crop management practices affecting water quality was conducted during 1978 in five Northwest Ohio counties. The counties are located in the Maumee River Basin which drains into Lake Erie. The survey was conducted in order to provide information for agencies and groups involved in pollution abatement programs.

SURVEY METHODS

The survey was conducted by Mr. Robert Rettig, the Best Management Practices technician employed by the Maumee Valley Resource Conservation Development and Planning Organization (RCD&PO). Mr. Rettig works under the supervision of Mr. Marion Kroetz, Area Extension Agronomist and is housed in the Area Extension Center in Defiance, Ohio.

The goal was to complete 75 randomly selected, personal interviews of farmers living within the five counties comprising the Maumee Valley RCD&PO area. The sample was drawn from lists made available through the Agricultural Stabilization and Conservation Service (ASCS). The lists contained the names of 6068 farm owner-operators and farm operators. An over-sample of 82 farmers were selected in order to account for refusals.

Farmers were informed about the survey by letter and instructed that interviews would be conducted during January and February of 1978. Each interview took one to three hours to complete, depending on the side

issues discussed. The interviewer read the questions from the survey form and recorded the answers. A copy of the introductory letter and the survey form are contained in the Appendix.

Several of the survey instrument questions were taken from "Survey of U.S. Great Lakes Basin Farmers Regarding Water Pollution From Agricultural Activities." The survey was conducted in July, 1977 by the Statistical Reporting Service (SRA), U.S. Department of Agriculture (USDA). Comparisons of responses by Northwest Ohio farmers with those participating in the Great Lakes Basin Survey are made throughout the report.

The number randomly selected from each study county vs. the number of completed interviews is shown in Table 1. Of the 82 farmers selected for the survey, 60 were interviewed. Reasons for not participating in the survey are listed in Table 2. Only two of the 22 farmers refused to

TABLE 1: THE TOTAL NUMBER OF FARM OWNER-OPERATORS OF FARM OPERATORS IN FIVE NORTHWEST OHIO COUNTIES, THE NUMBER SELECTED FOR INTERVIEW, AND THE NUMBER OF COMPLETED INTERVIEWS, 1978.

County	Total Owner-Operators or Operators	Randomly Selected for Interview	Completed Interviews
Defiance	1110	15	9
Fulton	1480	20	17
Henry	1184	16	13
Paulding	888	12	8
Williams	1406	19	13
Total	6068	82	60

participate in the survey because of concern about the use of the information. Three farmers gave no reason for refusing. Five individuals no longer farmed. The rest could not be contacted dur to reasons connected with job, sickness, incomplete address, and vacation.

TABLE 2: TOTAL NUMBER OF INDIVIDUALS WHO DID NOT PARTICIPATE IN THE SURVEY AND REASONS FOR NOT PARTICIPATING, 1978.

Reason For Not Participating	Number Not Participating
No longer farmed	5
Not home due to another job	4
Member of family in hospital	3
Unable to contact	3
Concern with use of information	2
Too busy	1
Vacation	1
No Reason	3
Total	22

Survey Respondents Characteristics Compared to Total Population

A random sample should reflect accurate information on the population from which the sample was drawn. Therefore, surveyors must look for ways in which to verify the accuracy of their sample. The following information strongly suggests the farmers who participated in the sample were representative of farmers living in the five-county study area in Northwest Ohio.

In Table 3, the sample is broken-down by the number of farmers living in each study county vs. the soil texture group from which they farm. In order to verify the representativeness, these data were used for comparison against data collected by the USDA Soil Conservation Service.

TABLE 3: NUMBER AND PERCENT DISTRIBUTION OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES BY SOIL TEXTURE GROUPS, 1978.

County	Number	Percent of Total	Soil Texture			
			Paulding Roselm	Other Lakebed Clays	Silt-Loam; Silty Clay-Loam	Sandy-Loams and Sands
			Number			
Defiance	9	15.0	3	5		1
Fulton	17	28.3		6	4	7
Henry	13	21.7		10		7
Paulding	8	13.3	4	4		
Williams	13	21.7		1	12	
Total	60		7	26	16	11
Percent of Total		100.0	11.7	43.3	26.7	18.3

Soil surveys have been completed in Henry (1974:69)[2], Paulding (1960:8), and Williams (1978:76), counties by the USDA Soil Conservation Service. A comparison of soil texture groups found in this survey vs. those found by the USDA showed a similar percentage distribution. According to USDA's data, Henry County's soils were 82 percent clay soils and 17 percent sandy soils. Seventy-seven percent of Henry County survey respondents farmed lakebed clay soild, while 23 percent farmed sandy soils. For Paulding County, the USDA reported that over 92 percent of the soil was clay. The present study found 100 percent of the respondents farming clay soils. The USDA reported over 70 percent of the Williams County soils as outside

[2]Denotes reference publication year and page number. See references at the end of the written text.

of the lakebed, and of the silt-loam and silty clay-loam texture. Of the Williams County respondents, 92 percent farmed soils outside the lakebed. The percentage differences in the soil texture data collected by USDA and the present study were minor and relatively insignificant.

Information on survey respondents' status of farming, age, and size of farm by county is listed in Table 4. The sample data were compared with information reported in the Census of Agriculture, Ohio State and County Data (U.S. Department of Commerce, 1974:121, 517, 211, 379, 577). Sixty percent of the sample were full-time farmers compared to 69 percent listed as full-time farmers in the 1974 Census of Agriculture. Over one-half of the sample were crop farmers. The average age of farmers in the sample was 44.1 years, slightly lower than the average age of 49.7 years calculated by the Bureau of Census for farmers in these same counties. The average size farm in the survey was 273 acres; in the 1974 Census of Agriculture, 188 acres. The difference was probably due to differences in definitions used for "size of farm" and "farm operator" in the census and this survey.

Survey respondents were asked questions on crops they produced. This information was compared with acreage devoted to these crops as reported by the Ohio Crop Reporting Service for 1977 (Table 5). Corn and soybeans were the crops produced on 74 percent of the acreage in the survey as compared with 72 percent of the acreage reported in the Ohio Agricultural Statistics, 1977 Annual Report (1977:9, 19).

TABLE 4. PERCENT OF RESPONDENTS BY COUNTY VS. STATUS AS A FULL OR PART-TIME FARMER, TYPE OF FARM, AGE, AND ACRES, 1978.

County	Full or Part Time		Type		Age[1]						Acres Operated[2]					
	Full Time	Part Time	Crop	Crop & Live-Stock	Under 30	30-39	40-49	50-59	60-69	Over 69	Under 100	100-199	200-299	300-399	400-499	Over 500
Defiance	66.7	33.3	22.2	77.8	22.2	11.1	11.1	33.3	11.1	11.1	44.4	22.2	--	--	11.1	22.2
Fulton	64.7	35.3	64.7	35.3	5.9	17.6	17.6	47.1	5.9	5.9	29.4	29.4	17.6	5.9	5.9	11.8
Henry	61.5	38.5	84.6	15.4	23.1	30.8	--	15.4	15.4	15.4	15.4	30.8	30.8	7.7	15.4	--
Paulding	62.5	37.5	62.5	37.5	25.0	25.0	25.0	12.5	12.5	--	25.0	--	--	37.5	12.5	25.0
Williams	46.2	53.8	61.5	38.5	23.1	38.5	23.1	15.4	--	--	23.1	23.1	23.1	7.7	--	23.1
Total	60.0	40.0	61.7	38.3	18.3	25.0	15.0	26.7	8.3	6.7	26.7	23.3	16.7	10.0	8.3	15.0

[1]Median age 41 years and average age 44.1 years.
[2]Median acreage 189 and average acres operated 273.

TABLE 5. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES DEVOTING ACREAGE TO SEVERAL CROPS BY OWNERSHIP OF ACRES FARMED COMPARED TO ALL PRODUCERS, 1978.

CROP	Ownership of Land			ACREAGES OF ALL PRODUCERS IN 5 COUNTY AREA**
	OWNED	RENTED	TOTAL	
Corn	43.4	30.0	35.3	32.3
Soybeans	32.8	41.8	38.3	39.3
Wheat	13.0	15.8	14.7	21.1
Oats	3.2	5.8	4.7	3.1
Hay & Plowdown Clover	5.1	4.3	4.8	3.5
Contract Crops	2.1	2.3	2.3	.7
Total	100.0	100.0	100.0	100.0

*1977 Ohio Agricultural Statistics, Ohio Crop Reporting Service, June 1978.

RESULTS AND DISCUSSION

A. Attitudes

Debate continues by both the farm and non-farm public on the effect of erosion, fertilizer, and manuer on water pollution. The attitudes of farmers who participated in the Northwest Ohio survey are listed in Table 6. The questions were designed to be answered yes, no, or no opinion. The interviewer added the category of "Yes, but very little" when the respondent answered questions in this manner. Eighty percent of the respondents indicated that erosion contributed to pollution while 60 percent said fertilizer contributed to pollution. Fewer respondents (38%) felt manure contributed to pollution. The Great Lakes Basin survey asked similar questions about the contribution of erosion, fertilizer and manure to water pollution, and found a lower percentage of respondents considering these items to be sources of water pollution. The Great Lakes

survey reported 44.9 percent of their respondents listed erosion as a source of water pollution; 32.2 percent fertilizer; and 19.2 percent manure (1977:4). It appears that farmers in Northwest Ohio were more aware of water pollution problems than farmers in the total Great Lakes Basin.

TABLE 6: PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES EXPRESSING OPINIONS ON THE CONTRIBUTION OF EROSION, FERTILIZER, AND MANURE TO POLLUTION, 1978.

Contributes to Pollution	Erosion	Fertilizer	Manure
Yes	66.7	48.3	21.7
Yes, but very little	13.3	11.7	16.7
No	11.7	31.7	50.0
No opinion	8.3	8.3	11.7
Total	100.0	100.0	100.0

Table 7 gives a breakdown on how the type of farmer, age, and acres farmed affected answers to questions on "erosion contributing to water pollution." A higher percentage of part-time farmers (87%) than full-time farmers (76%) listed erosion as a contributor to water pollution. However, the difference between the two groups was small. When the responses to the question were summarized by age of the respondents, as under or over 50 years, no difference in answers were found. Eighty percent of both age groups stated erosion contributed to water pollution. The greatest difference appeared when size of farm was examined. Ninety-five percent of those farming over 300 acres stated erosion contributed to water pollution while 72 percent farming under 300 acres answered "yes" to the question.

TABLE 7. PERCENT OF OPINIONS OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES ON THE CONTRIBUTION OF EROSION TO WATER POLLUTION BY TYPE OF FARMER, AGE, AND SIZE OF FARM, 1978.

Contributes To Pollution	Type		Age		Acres		Total Group
	Full-Time	Part-Time	Under 50	Over 50	Under 300	Over 300	
Yes	62.2	73.9	68.6	64.0	57.5	85.0	66.7
Yes, but very little	13.5	13.1	11.4	16.0	15.0	10.0	13.3
No	13.5	8.7	11.4	12.0	15.0	5.0	11.7
No Opinion	10.8	4.3	8.6	8.0	12.5	--	8.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Along with farmers attitudes on what contributes to water pollution, a related question was asked on rate of phosphorus (P_2O_5) needed for 125 bushels of corn. Phosphorus is the major nutrient problem affecting Lake Erie. Some have suggested P_2O_5 fertilizer rates are presently too high. Phosphorus soil test levels were very low when farmers first started to fertilize according to crop needs. Consequently, high application rates of P_2O_5 were used to build up these low soil P_2O_5 levels. Now, most soils contain P_2O_5 at adequate levels. Farmers now only need apply at crop removal rates in order to obtain optimum yield.

According to research data, about 50 pounds of P_2O_5 per acre is removed by a 125-bushel yield of corn. The average rate of application listed by the respondents was 54 pounds of P_2O_5 per acre and the median rate was 60 pounds (Table 8). Seventy-five percent indicated P_2O_5 application rates of under 80 pounds were needed, while 95 percent felt rates of under 100 pounds of P_2O_5 per acre were needed. Some farmers apply fertilizer needed for both corn and soybean crops to the corn crop.

The amount of P_2O_5 removed with a 40-bushel soybean crop is 32 pounds of P_2O_5 per acre.

TABLE 8. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES FAVORING DIFFERENT RATES OF PHOSPHORUS (P_2O_5) THAT SHOULD BE USED FOR 125 BUSHEL CORN CROP, 1978.

Rate of P_2O_5 Per Acre*	Percent
Less than 80 pounds	75
81-99 lbs.	20
100 lbs. or more	5
Total	100

*Average rate 54 lbs./acre; median rate 60 lbs./acre; range in rate 0 to 200 lbs./acre.

Both the Northwest Ohio Survey and Great Lakes Basin Survey asked question to determine whether respondents were Soil and Water Conservation District (SWCD) members and whether they followed a Soil Conservation Service (SCS) conservation farm plan. The interviewer in the Northwest Ohio survey referred specifically to an SCS developed conservation plan while the Great Lakes Survey asked only if the respondent was following a current conservation plan. In the Great Lakes Basin Survey, the conservation plan could have been developed by anyone, including the farm operator.

Table 9 provides this information for the Northwest Ohio survey. Over 50 percent of respondents indicated they were SWCD cooperators while less than 25 percent of respondents indicated they were following a SCS conservation farm plan. This indicates that less than 50 percent of SWCD cooperators follow their conservation farm plan. No attempt was made to find out why the conservation plan was not followed. In comparison, the

Great Lakes Basin Survey found 39.3 percent of respondents to be local SWCD cooperators and 49.6 percent of the total respondents to be using a current conservation plan (1977:6).

TABLE 9. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES WHO WERE SOIL AND WATER CONSERVATION DISTRICT (SWCD) COOPERATORS AND USERS OF THE SOIL CONSERVATION SERVICE (SCS) FARM PLAN, 1978.

	SWCD Cooperator	Use SCS Farm Plan
Yes	53.3	23.2
No	46.7	76.7
Total	100.0	100.0

Many people have expressed the opinion that it will be necessary to rely on voluntary cooperation to solve farm related pollution problems. In fact, the Federal Rural Clean Water Program and the Ohio House Bill 513, adopted in 1978, follow this principle as the basis for reducing pollution from erosion. As expected, farmers in the survey agreed that it is best to rely on voluntary cooperation of farmers to solve farm-related water pollution problems. Table 10 shows that 83 percent of the respondents agreed with the principle of voluntary cooperation. An even higher percentage of part-time farmers, farmers over 50, and farmers operating over 300 acres agreed with the principle of voluntary cooperation. The Great Lakes Basin Survey found 70.6 percent agreeing that it is best to rely on voluntary cooperation to solve farm-related water quality problems (1977:5).

TABLE 10. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES AGREEING, DISAGREEING, OR HAVING NO OPINION TO THE STATEMENT: TO SOLVE FARM RELATED WATER POLLUTION PROBLEMS, IT IS BEST TO RELY ON VOLUNTARY COOPERATION OF FARMERS; BY TYPE OF FARMER, AGE, AND ACRES, 1978.

	Type		Age		Acres		
	Full Time	Part Time	Under 50	Over 50	Under 300	Over 300	Total Group
Agree	78.4	91.4	74.3	96.0	80.0	90.0	83.3
Disagree	5.4	4.3	8.6	--	2.5	10.0	5.0
No Opinion	16.2	4.3	17.1	4.0	17.5	--	11.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

If agricultural pollution regulations are imposed someday, Northwest Ohio farmers would prefer local agencies administer them. When respondents were asked what agencies should administer regulations on pollution control, 86.7 percent favored local agencies (Table 11). The preference for local administration was even stronger among farmers

TABLE 11. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES ON THEIR ANSWERS TO THE QUESTION ON WHO SHOULD ADMINISTER AGRICULTURAL POLLUTION REGULATION IF IMPOSED, BY TYPE OF FARMER, AGENT, AND ACRES, 1978.

	Type		Age		Acres		
	Full Time	Part Time	Under 50	Over 50	Under 300	Over 300	Total Group
Local	89.2	82.6	91.3	80.0	82.5	95.0	86.7
State	2.7	8.6	2.9	8.0	7.5	--	5.0
Federal	8.1	4.4	2.9	12.0	7.5	5.0	6.7
No Opinion	--	4.4	2.9	--	2.5	--	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

under 50 years of age and those farming over 300 acres. Only 56.5 percent of respondents in the Great Lakes Basin Survey favored local agency administration (1977:5).

There was no majority support for having any one local agency administer agricultural pollution control regulations. However, over one-third of the respondents favored either the Soil and Water Conservation Districts or Soil Conservation Service (Table 12).

TABLE 12. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES PREFERRING A SPECIFIC LOCAL AGENCY FOR ADMINISTERING AGRICULTURAL POLLUTION CONTROL REGULATIONS, 1978.

Agency	Total Group
Soil and Water Conservation District	23.3
Soil Conservation Service	13.3
County Commissioners	8.3
Agricultural Stabilization Conservation Service	11.7
Township Trustees	10.0
Combination of Above	15.0
None of Above	18.4
Total	100.0

Cost sharing to encourage farmers to establish erosion control practices has often been suggested. The recent enactment of Ohio House Bill 513 made cost sharing possible. The Great Lakes Basin Survey revealed that 31 percent of respondents felt farmers should pay the entire cost of controlling water pollution created by their own operations, while 66 percent suggested the federal government should pay for pollution control on farms (1977:5). The Northwest Ohio Survey revealed that 65 percent favored the farmer paying the entire cost of controlling

pollution created by his farm (Table 13). The feeling was strongest among part-time farmers, farmers under 50 years of age, and farmers operating over 300 acres. A substantial majority of Northwest Ohio farmers (85.0%) stated federal and/or state government should help to pay the cost of controlling agricultural pollution (Table 14). The feeling was strongest among farmers under 50 years of age. Size of farming operation and whether the operation was full or part-time had no bearing on responses to the question.

TABLE 13. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES WHO FEEL FARMERS SHOULD PAY THE COST OF CONTROLLING EROSION ON THEIR FARM IF THEY CREATE A SIZEABLE AMOUNT OF WATER POLLUTION, BY TYPE OF FARM, AGE, AND ACRES, 1978.

	Type		Age		Acres		
	Full Time	Part Time	Under 50	Over 50	Under 300	Over 300	Total Group
Yes	40.5	65.2	48.6	52.0	45.0	60.0	50.0
Yes, if Deliberate	21.6	4.4	20.0	8.0	15.0	15.0	15.0
No	35.1	30.4	31.4	36.0	37.5	25.0	33.3
No Opinion	2.8	--	--	4.0	2.5	--	1.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

It appears that the responses listed in Table 13 and 14 are conflicting. However, the questions represent two different types of situations. The erosion referred to in Table 13 was a sizeable amount directly caused by the farmer and, as indicated, the respondents felt responsible for paying for the cost of correcting the problem they created.

In Table 14, the responses referred to the general question of having federal and state governments participate in paying for practices to

reduce agricultural water pollution. Respondents felt these governmental units should help pay.

TABLE 14. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES FAVORING FEDERAL AND/OR STATE SUPPORT IN CONTROLLING AGRICULTURAL EROSION BY TYPE OF FARM, AGE, AND ACRES FARMED, 1978.

	Type		Age		Acres		
	Full Time	Part Time	Under 50	Over 50	Under 300	Over 300	Total Group
Yes	83.8	87.0	91.3	76.0	85.0	85.0	85.0
No	10.8	4.3	2.9	16.0	5.0	15.0	8.3
No Opinion	5.4	8.7	5.8	8.0	10.0	--	6.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Some conservation practices, such as filter strips, may take some land out of production. Other conservation practices, such as no-tillage, are also commonly suggested as methods to reduce erosion. Research has shown that these practices are very effective on sloping soils. Conservation tillage will reduce erosion and maintain or increase yields on sloping soils. Research has shown also that conservation tillage may reduce yields on the poorly drained, level fine-textured clay soils found in Northwest Ohio and yet have little or no effect on reducing erosion. If conservation tillage practices, that result in lower yields, could be identified, would farmers be willing to take a yield reduction since conservation tillage usually reduces cost of production? Table 15 shows that 42 percent of respondents were not willing to take a yield reduction and 23 percent were willing to take a reduction of from one to five bushels. Those feeling strongest about taking no reduction were full-time farmers,

farmers under 50 years of age and farmers operating over 300 acres. There are more risks involved with conservation tillage and farmers were reluctant to accept these higher risks and potential reduced yields.

TABLE 15. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES WILLING TO TAKE A CORN YIELD REDUCTION FROM PRACTICES THAT WOULD CONTROL SEDIMENTATION BY TYPE OF FARM, AGE, AND ACRES FARMED, 1978.

Yield Reduction Bu./Acre	Type		Age		Acres		Total Group
	Full Time	Part Time	Under 50	Over 50	Under 300	Over 300	
0	43.3	39.1	45.7	36.0	42.5	40.0	41.7
1-5	21.6	26.1	22.6	24.0	20.0	30.0	23.3
6-10	27.0	26.1	38.6	24.0	25.0	30.0	26.7
7-10	8.1	8.7	3.1	16.0	12.5	--	8.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Over 80 percent of farmers were interested in learning more about pollution control practices. As is shown in Table 16, farmers under age 50 and farmers with over 300 acres appeared to be even more interested in learning about pollution control. In addition to indicating interest, most farmers listed one or more pollution control practices in which they were particularly interested. In the Great Lakes Basin Survey, a similar question read: "Farmers need more information on how they can control water pollution." Seventy-seven percent responded "yes" to the question (1977:5).

Farmers were also asked what they considered as the most reliable sources of information about farm practices and pollution control practices. Regarding farm practices, all but three of the 60 farmers chose at least

one of the seven sources of information listed in Table 17. Almost 52 percent of the respondents chose magazines as their most reliable source while 28 percent preferred individual contacts. A very small percentage of respondents stated preferences for meetings, government publications or radio. Newspapers and television were not mentioned by respondents as sources of reliable information

TABLE 16. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES INDICATING AN INTEREST IN LEARNING MORE ABOUT POLLUTION CONTROL BY TYPE OF FARM, AGE, AND ACRES FARMED, 1978.

	Type		Age		Acres		
	Full Time	Part Time	Under 50	Over 50	Under 300	Over 300	Total Group
Yes*	81.1	82.6	88.6	72.0	75.0	95.0	81.7
No	18.9	17.4	11.4	28.0	25.0	5.0	18.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

*91.8% of the respondents indicating "yes" listed one or more Pollution Control Practices they were interested in.

The sources of information about agricultural practices listed as second most reliable included 20 percent of the respondents for magazines, 20 percent for newspapers, and 12 percent for individual contacts. The other 17 percent of respondents were about equally divided in preferences for government publications, newspapers and television.

Regarding sources of information about pollution control practices, the highest percentage of respondents (30%) again chose magazines as their most reliable source of information. The second largest percentage of respondents (13%) chose government publications, while 12 percent

chose individual contacts and 10 percent chose meetings. Newspapers and radio were considered most reliable sources of information by only 8 percent and 2 percent of the respondents, respectively.

As second most preferred sources of information, 8 percent of respondents favored magazines, 7 percent favored newspapers, 7 percent favored individual contacts, and 5 percent favored government publications. Other sources were favored by less than 5 percent of the respondents.

The Great Lakes Basin Surveys asked a similar question: "Where do you get information about water pollution?" and asked respondents to check all sources. Newspaper and magazines were listed by 80 percent; radio,

TABLE 17. SOURCES OF INFORMATION ON AGRICULTURAL PRACTICES AND POLLUTION CONTROL PRACTICES CONSIDERED MOST RELIABLE BY PERCENTAGE OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES, 1978.

	Agricultural Practices			Pollution Control Practices		
	Most Reliable	Second Most Reliable	Third Most Reliable	Most Reliable	Second Most Reliable	Third Most Reliable
Magazines	51.7	20.0	--	30.0	8.3	--
Newspapers	--	5.0	--	8.3	6.7	1.7
Meetings	6.7	20.0	--	10.0	3.3	--
Government publications	6.7	6.7	5.0	13.3	5.0	--
Television	--	5.0	1.7	--	1.7	--
Radio	1.7	--	--	1.7	--	--
Individual Contacts	28.3	11.7	1.7	11.7	6.7	--
No response	4.9	31.6	91.6	25.0	68.3	98.3
Total	100.0	100.0	100.0	100.0	100.0	100.0

35 percent; television, 37 percent; farm organization meetings, 24 percent; and Government publications and meetings with Government personnel, 41 percent (1977:6).

B. EROSION PROBLEMS AND FARMING PRACTICES RELATED TO WATER QUALITY

Table 18 shows the number of respondents growing different crops on both owned and rented land, acres raised, and yield. Table 5 showed 43 percent of owned land was used for corn and 33 percent for soybeans or 76 percent of owned land devoted to these two row crops. Seventy-two

TABLE 18. SELECTED CROP STATISTICS OF SURVEY RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES BY OWNERSHIP OF LAND, 1978.

	Corn	Soybeans	Wheat	Oats	Hay & Plowdown	Contract Crops
Owned Land						
No. of farmers growing crops[1]	36	35	30	14	16	2
Median acres	57	50	20	10	15	22
Range in acres	18-350	10-175	8-75	6-40	4-70	22-110
Median yield	115 bu/A.	40 bu/A.	50 bu/A.	80 bu/A.	4 T/A.	25 T/A.
Range in yield	40-160	23-50	35-80	50-120	2-10	25-32
Rented Land						
No. growing crops[2]	33	35	30	11	10	3
Median acres	60	70	38	20	20	90
Range in acres	8-300	20-600	10-250	4-200	5-100	10-115
Medium yield	110	35	50	75	2	23
Range in yield	57-150	22-45	35-70	50-110	2-6	18-25

[1]44 farmers owned land
[2]38 farmers rented land

percent of rented land was used for corn and soybeans. Table 18 reveals that neither corn nor soybeans were grown on all farms. Yields reported are only slightly higher than Northwest Ohio average yield for corn of 105 bu./acre and 35 bu. for soybeans.

Survey respondents were asked to report the primary tillage practice followed for each of their crops. Table 19 reports tillage practices for corn and soybeans by soil texture groups. Almost all of the Paulding Roselm and other lakebed clay soils were fall plowed for corn. About two-thirds of the silt-loam and silty-clay-loam soils were fall plowed for corn and only 14 percent of sandy soils fall plowed. The silt-loams and sandy soils are more adapted to reduced or conservation tillage than clay soils. The tillage practices for soybeans on the clay soils were somewhat different than for corn. Fewer were fall plowed. Some of this is due to no corn in the rotation, especially on the Paulding and Roselm soils where there is little residue to incorporate.

Survey respondents were asked about erosion problems on their farms. Most did not indicate erosion as a problem on their farms as reported (Table 20). Over two-thirds listed no problem with gully erosion, ditch bank erosion, stream bank erosion, sheet erosion, or wind erosion. The others listed these five types of erosion as minor problems with less than 5 percent considering them as major problems. Research of Northwest Ohio's fine textured soils and relatively flat topography have placed sheet erosion as the principal problem of sedimentation of stream and Lake Erie. However, erosion and its visual evidence is relatively minor when compared to more sloping soils.

TABLE 19. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES REPORTING TILLAGE PRACTICES USED FOR CORN AND SOYBEANS BY SOIL TEXTURE GROUPS, 1978.

	Corn				Soybeans			
Tillage	Paulding Roselm	Other Lakebed Clays	Silt-Loam, Silty-Clay-Loam	Sandy-Loams and Sands	Paulding Roselm	Other Lakebed Clays	Silt-Loam, Silty-Clay-Loam	Sandy-Loams and Sands
Fall Plow	100.0	90.0	61.9	14.3	42.8	69.7	65.0	--
Fall Chisel	--	3.3	23.8	7.1	14.3	21.2	15.0	18.2
Fall Disc	--	--	--	--	14.3	--	--	--
Spring Plow	--	3.3	4.8	78.6	14.3	3.0	10.0	81.8
Spring Chisel	--	3.3	--	--		--	--	--
Spring Disc	--	--	9.5	--	14.3	6.1	10.0	--
No Till	--	--	--	--	--	--	--	--
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 20. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES IDENTIFYING SELECTED EROSION PROBLEMS BY DEGREE OF PROBLEM, 1978.

Degree of Problem	Gully Erosion	Ditch Bank Erosion	Stream Bank Erosion	Sheet Erosion	Wind Erosion
No Problem	66.7	70.0	91.7	68.3	80.0
Minor Problem	30.0	28.3	6.6	31.7	18.3
Major Problem	3.3	1.7	1.7	-	1.7
Total	100.0	100.0	100.0	100.0	100.0

Most farmers were using at least one or more erosion control practices (Table 21). The most popular conservation practices were tile drainage, tile extension, structures, and keeping residue on soil surface. Waterways and filter strips were used on about one-third of the farms.

TABLE 21. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES NOW USING SELECTED EROSION CONTROL PRACTICES, 1978.[1]

	Grass Waterway	Glass Filter Strip[2]	Tile Drainage	Surface Drainage	Tile Extension	Structures	Wind Break	Residue	Other
Yes	38.3	30.0	76.2	12.1	65.0	45.0	10.0	55.0	58.3
No	61.7	70.0	23.8	87.9	35.0	55.0	90.0	45.0	41.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

[1]Percent shown for each practice based on number using practice except for Tile and Surface Drainage which is based on acres drained.
[2]55 percent of Filter Strips were 6-10 feet wide.

Drainage improvements are listed in Table 22 by both owned and rented land. The types of drainage do differ significantly between owned and rented land.

TABLE 22. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES INDICATING DRAINAGE IMPROVEMENTS ON OWNED AND RENTED LAND, 1978.

	Owned		Rented	
	Farms	Acres	Farms	Acres
Tile Drained	71.4	69.0	47.4	65.1
Surface Drained	2.4	2.8	5.3	2.4
Tile and Surface Drained	21.4	7.3	42.1	11.1
Not Drained	4.8	20.9	5.2	21.4
Total	100.0	100.0	100.0	100.0

Nitrogen, phosphorus, and potassium rates for all crops are found in Table 23 with time of application listed in Table 24. The highest nitrogen rate listed for corn was 224 pounds per acre. The Ohio State University recommends up to 240 pounds of nitrogen per acre for continuous corn with 160 bushels yield goal. Thus, the amount of nitrogen being applied is below recommended rates. Phosphorus rates for corn and soybeans are based on the amount removed by the crop. All of the corn received fertilizer. Slightly over one-half of the soybeans was fertilized with median phosphorus rates recommended for corn and soybeans to achieve slightly above crop removal rates.

Most of the fertilizer for corn and soybeans was applied at planting time which minimized the loss of these nutrients (Table 24). The exceptions being about 20 percent of the farmers applied phosphorus and potassium in the fall. Farmers were probably plowing under most of the fall applied phosphorus and potassium which minimizes direct loss of fertilizer should runoff occur. Both the rates of fertilizer applied and time of application used by survey respondents would have very little detrimental effect on water quality.

TABLE 23. FERTILIZER USED BY RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES ON SELECTED CROPS ON BOTH OWNED AND RENTED LAND, 1978.

	Corn		Soybeans		Wheat		Oats		Hay & Plowdown		Contract Crop	
	Owned	Rented	Owned	Rented	Owned	Rented	Owned	Rented	Owned	Rented	Owned	Rented
Nitrogen (N)												
Median Rate (lbs.N/A)	162	145	9	9	60	63	35	32	32	18	120	110
Range of Rates (lb.N/A)	100-220	48-224	0-32	0-32	21-164	16-130	6-100	0-50	0-32	0-72	120-175	80-120
Percent Applying Nitrogen	100	100	54	40	100	100	100	91	6	20	100	100
Phosphorus (P_2O_5)												
Median Rate (lb.P_2O_5/A)	64	75	30	29	52	48	36	42	46	46	150	120
Range of Rates (lb.P_2O_5/A)	24-125	40-150	0-64	0-80	16-88	0-88	0-84	0-60	0-120	0-184	150-290	115-150
Percent Applying Phosphorus	100	100	60	46	100	90	93	91	19	50	100	100
Potassium (K_2O)												
Median Rates (lb.K_2O/A)	100	108	36	32	52	48	36	48	60	72	180	120
Range of Rates (lb.K_2O/A)	24-250	32-250	0-130	0-100	16-160	0-88	8-84	0-60	0-180	0-240	180-300	120-300
Percent Applying Potassium	100	100	60	46	100	90	100	91	28	50	100	100

TABLE 24. PERCENT OF RESPONDENTS IN FIVE NORTHWEST OHIO COUNTIES REPORTING TIME AT FERTILIZER APPLICATION ON CORN AND SOYBEANS, 1978.

Time of application	Nitrogen		Phosphorus		Potassium	
	Corn	Soybeans	Corn	Soybeans	Corn	Soybeans
Fall	--	14.7	--	13.5	5.8	13.5
Preplant	2.9	11.8	4.3	16.2	8.7	16.2
Planting	26.0	70.6	50.7	64.9	24.6	56.8
Side dress	1.4	2.9	--	2.7	--	2.6
Fall & Preplant	--	--	1.4	--	1.4	--
Fall & Planting	2.9	--	24.6	2.7	31.9	5.4
Preplant & Planting	5.8	--	19.0	--	27.6	5.4
Preplant & Side dress	2.9	--	--	--	--	--
Planting & Side dress	58.1	--	--	--	--	--
Total	100.0	100.0	100.0	100.0	100.0	100.0

SUMMARY

The survey revealed several facts about Northwest Ohio agriculture that have implications for water quality improvement programs. Farmers were aware that erosion was a problem. But as individuals, they felt they were making only minor contributions to the water pollution problem. They were also using conservation practices such as tile drainage, tile extensions, structures, residue, grass waterways, and filter strips to reduce erosion. Farmers were minimizing direct pollution from fertilizer by using recommended rates, applying most of the fertilizer near planting time. While fall plowing was the principal tillage practice on the fine textured clay soils in the lakebed, other tillage practices such as fall

chisel plowing or spring plowing were being used on the soils for which these tillage practices are recommended.

Northwest Ohio farmers preferred voluntary programs to reduce erosion, and appeared to be very interested in learning about conservation practices that will reduce erosion and maintain yields. Yield reducing practices will not be accepted by Northwest Ohio farmers. It appears the challenge is to find practices that will reduce erosion and yet maintain farm income. It appears that farmers would be willing to use those types of practices to reduce erosion.

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U.S.D.A. Soil Conservation Service
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A P P E N D I X

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COLLEGE OF AGRICULTURE AND HOME ECONOMICS OF THE
OHIO STATE UNIVERSITY AND THE UNITED STATES
DEPARTMENT OF AGRICULTURE COOPERATING

DEFIANCE
AREA EXTENSION CENTER

December 1977

TO: SELECTED FARM OPERATORS IN WILLIAMS, FULTON, DEFIANCE, HENRY, AND PAULDING COUNTIES

Dear Sirs:

AGRICULTURE NEEDS YOUR HELP!

There is much concern today over the condition of our lakes and streams with Lake Erie being targeted as one of the two lakes in the United States needing immediate attention. With reduction of pollution from cities already taking place, officials are now looking to steps to reduce pollution from agricultural sources.

We need to get accurate information on farming practices in the Maumee Basins and also attitudes of farmers on ways to reduce pollution from agricultural land.

You have been randomly selected as one of 75 persons in the five county area to be personally interviewed. The interviewing will be done by Robert Rettig of rural Henry County. He is employed by Maumee Valley Resource, Conservation, and Planning Organization (MVRCD & PO) and is housed in the Area Extension Office. We are providing technical supervision and coordinating his work on water quality with research being conducted in Northwest Ohio.

The Extension Service needs this information in order to develop an educational program in the area of improving water quality. The information will also be used by MVRCD & PO in their areawide water quality plan (208). This plan needs farmer input.

Mr. Rettig will call you by telephone within the next 8 weeks to answer any of your questions and to set up an appointment to visit you on your farm, if possible. The interview on your farm should take approximately one hour. <u>All individual information will be kept confidential</u>.

If you have questions or concerns, please write or call Mr. Rettig at the Defiance Area Extension Center, Route #2, Defiance 43512, phone 784-3838.

Your cooperation is much appreciated and will be extremely important to agriculture in Northwest Ohio. Your attitude and ideas as expressed in our survey will help formulate recommendations for both improving water quality and maintaining agricultural production. Otherwise, recommendations that could affect you are likely to me made without adequate facts.

Sincerely,

Marion E. Kroetz

Marion E. Kroetz
Area Extension Agent, Agronomy

MEK:m

FARM PRACTICE AND ATTITUDE

SURVEY ON WATER QUALITY

1. General Information
   a. Name _____ b. County _____
   c. Township _____ d. Section _____
   e. Soil Types _____
   _____
   f. Full-time farmer _____ Part-time _____
   g. Crop farmer _____ Crop & Livestock Farmer _____
   h. Age _____
   i. Acres owned _____ Rented _____

2. Tillage and Fertilization Practices, rotation and yield

   A. Practices on owned acres

	Corn	Soybeans	Wheat	Oats	Hay	Contract Crops	Other
Normal acres, Number							
Normal yield							
Tillage practices							
Fertilizer Used Lbs./A N-P_2O_5- K_2O							
Time of Fertilizer Application							

   B. Practices on rented acres

	Corn	Soybeans	Wheat	Oats	Hay	Contract Crops	Other
Normal acres, Number							
Normal yield							
Tillage practices							
Fertilizer Used Lbs./A N-P_2O_5-K_2O							
Time of Fertilizer Application							

3. Drainage System

		Owned	Rented
a. Acres tile drained			
b. Acres surface drained			
c. Acres tile and surface drained			
d. Age and condition of system			
e. Spacing of tile and surface ditches			
f. How adequate is your system for good crop production	tile		
	surface		

4. a. Do you have any problems on your farm from:

	No problem	Minor problem	Major problem	Number of years
Gully Erosion				
Ditch Bank Erosion				
Stream Bank Erosion				
Sheet Erosion				
Other				

b. If yes to 4a, do you feel they are minor or major problems? (Interviewer's observations) _____

_____

c. Practices you are using to reduce soil erosion: Grass Waterway _____: Grass Filterstrip _____; Width of Filterstrip _____ft.; Tile Extension _____; Structures _____; Windbreak _____; Residue on Surface _____; Other _____

_____

d. Are you following a current conservation plan for your farm? Yes _____; No _____

e. Are you a SWCD cooperator? Yes _____; No _____

f. In your opinion, does eroded soil contribute to water pollution in the Maumee Basin? Yes _____; No _____; No Opinion _____

g. In your opinion, does fertilizer used in farming contribute to water pollution in the Maumee Basin? Yes _____; No _____; No Opinion _____

h. What rate of phosphorus do you feel should be used for a 125 bushel corn yield goal? _____ Lbs. P_2O_5/acre

i. In your opinion, does manure contribute to water pollution in the Maumee Basin? Yes _____; No _____; No opinion _____

j. To solve farm related water pollution problems, it is best to rely on voluntary cooperation of farmers. Agree _____; Disagree _____; No opinion _____

k. In your opinion, if regulations are ever imposed, who would you prefer administering them? (Interviewer does not give choice) Local _____; State _____; Federal _____; No opinion _____

l. If you chose local government, who would you choose to administer erosion control? Local SWCD _____; SCS _____; Co. Commissioners _____; Maumee Conservancy District _____; Some Type of Multi-County Committee _____; Combination of Above _____; None of Above _____

m. If a farmer does create a sizeable amount of water pollution by his operations, do you think he should pay the entire cost of controlling it? Yes _____; No _____; No opinion _____

n. Should the federal and state government help pay for practices to reduce agricultural water pollution? Yes _____; No _____; No opinion _____

o. Are you willing to take a reduction in yield from a practice necessary to reduce water pollution? (Answer for corn) None _____; 1-5 bu./acre _____; 5-10 bu./acre _____; more than 10 bu./acre _____

p. From what source(s) do you think you get the most reliable information about (1) farm practices; (2) agricultural water pollution? (Interviewer does not give choices)

	(1)	(2)		(1)	(2)
Magazines	_____	_____	TV	_____	_____
Newspapers	_____	_____	Radio	_____	_____
Meetings	_____	_____	Individual	_____	_____
Govt. Publications	_____	_____	contacts		

q. Would you be interested in learning more about cultural practices being tried to reduce erosion from land? Yes _____; No _____
If yes, which are of most interest? _____
_____
_____
_____